

Spontaneous Regression of Herniated Cervical Discs

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Abstract

Background: Regression of herniated cervical discs is not as commonly reported as herniated lumbar discs, particularly in studies confirmed by magnetic resonance imaging (MRI). CDH can be treated either conservatively or surgically.

Aim of Study: In our research, we are trying to show the effect of conservative management on the regression of herniated cervical discs proven by MRI.

Patients and Methods: Six patients with neck pain and radiculopathy who were diagnosed with CDH on magnetic resonance imaging (MRI) were enrolled in the study for conservative treatment. Only one patient who had myelopathy but refused surgical management was also enrolled in our study.

Results: Our study included six patients, 4 cases were female and 2 cases were male. The mean age of the patients was 37.5 years (range 32-45). One patient (16.66%) presented with myelopathy and five (83.33%) presented with neck pain and radiculopathy. Discs were paracentral in 4 cases (66.66%) and central in 2 cases (33.33%); only one case with a central disc bulge also had a cord signal. The most affected cervical discs were C5-C6 (3 cases = 50%), C4-C5 (2 cases = 33.33%), and C6-C7 (1 case = 16.66%).

Conclusion: Conservative treatment of herniated cervical discs is a good option in patients without neurological deficits. Satisfactory clinical improvement can be achieved conservatively in a significant percentage of patients. Moreover, the decrease in size of the herniated cervical disc that causes relief of neural compression can be demonstrated by images in some cases.

Key Words: Cervical disc herniation – Spontaneous regression – Conservative management.

Introduction

CERVICAL disc herniation (CDH) is a common cause of cervical radiculopathy, with an annual incidence of 18.6 per 100,000, and peak presentation in the sixth decade of life [1]. CDH has a multifactorial etiology and risk factors include smoking, male gender, lifting heavy objects, and occupations that require vibration [2].

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Arm pain typically follows a myotomal pattern, whereas sensory symptoms (e.g., burning, tingling) follow a dermatomal distribution. Radicular symptoms may also occur with motor weakness of the upper extremity and with myelopathy as a reflex changes [3].

Both conservative and surgical treatment options are available. Conservative treatment is effective for most patients, but in the case of refractory pain or loss of motor function, surgery may be recommended [4].

In this study, we present our experience with patients who had a satisfactory response to conservative treatment and showed radiological evidence of regression in the size of the herniated disc.

Patients and Methods

It is a retrospective study that included a series of six cases with herniated cervical discs treated at the Department of Neurosurgery, Benha University Hospitals from October 2016 to October 2021.

Patients' age, gender, clinical presentation, radiological diagnosis, treatment, and outcomes were documented and analyzed.

Patients presented with neck pain and radiculopathy without neurological deficit and magnetic resonance imaging (MRI) revealed CDH were enrolled for conservative treatment.

Abbreviations:

MRI	: Magnetic resonance imaging.
CDH	: Cervical disc herniation.
N	: Number.
CT	: Computed tomography.
OPD	: Out Patient department.
Ibs	: Pound.
MCP-1	: Monocyte chemotactic protein 1.
IL-8	: Interleukin 8.

As a result of the assessment, patients with clinical, neurological improvement and spontaneous regression detected radiologically by MRI cervical spine were included in our study.

The study included patients who refused surgery on their request but were seen at our outpatient department (OPD) for a check-up instead.

Patients with a neurologic deficit and myelopathic patients enrolled for surgery were not included in the study. Patients who didn't improve with conservative treatment and underwent surgery were excluded from the study.

Patients who did not attend for follow-up are also excluded from this study.

This study was approved by Research Ethics Committee of Neurosurgery Department, Faculty of Medicine, Benha University with research ethics board approval.

Results

Of a total of six patients, 4 cases (66.66%) were female and 2 cases (33.33%) were male. The patients' mean age was 37.5 years (range 32-45).

One patient (16.66%) presented with myelopathy and five (83.33%) presented with neck pain and radiculopathy.

Discs were paracentral in 4 cases (66.66%) and central in 2 cases (33.33%); only one case with a central disc bulge also had a cord signal.

The most affected cervical discs were C5-C6 (3 cases = 50%), C4-C5 (2 cases = 33.33%), and C6-C7 (1 case = 16.66%) (Table 1).

Table (1): Demographic clinical and radiological data of study group.

No	Age	Gender	Main presentation	Cervical level
1	36	F	Myelopathy	C 4-5
2	45	M	Neck pain + radiculopathy	C 4-5
3	34	F	Neck pain + radiculopathy	C 5-6
4	37	F	Neck pain + radiculopathy	C 5-6
5	41	F	Neck pain + radiculopathy	C 6-7
6	32	M	Neck pain + radiculopathy	C 5-6

On successive MRI scans, herniated cervical discs spontaneously regressed at an average time interval of 8.83 months after the initial presentation.

Case (1):

A 36-year-old woman presented to our hospital with a sudden onset of tetraparesis consistent with central cord syndrome and bilateral brachialgia. She denied any history of trauma. On examination, motor power was Grade 4-/5 on antigravity muscles and Grade 3/5 on progravity muscles, with mild urinary disturbance. There was bilateral Hoffmann's sign and ankle clonus, as well as hyperactive deep tendon reflexes. MRI of the cervical spine revealed a large disc herniation at the C4-5 level, compressing the anterior aspect of the spinal cord and causing an abnormal cord signal (Fig. 1-A). We recommended an urgent anterior discectomy and fusion procedure. During preoperative preparation, the patient was feverish and had a low oxygen saturation level. The CT chest showed diffuse ground glass opacities. The patient was admitted to the COVID-19 isolation unit and received the standard treatment including oxygenation and dexamethasone. Ten days later, the general conditions improved, and fitness for general anesthesia was declared. Preoperatively, motor power improved by one grade across all muscle groups, and the patient reported that her brachialgia had improved. The patient and her family refused surgery against medical advice and was discharged on physiotherapy and medical treatment (vitamin B complex and analgesics). She attended our outpatient clinic for follow-up every two weeks. In the third month, she performed a new MRI cervical spine shown in Fig. (1 -B).

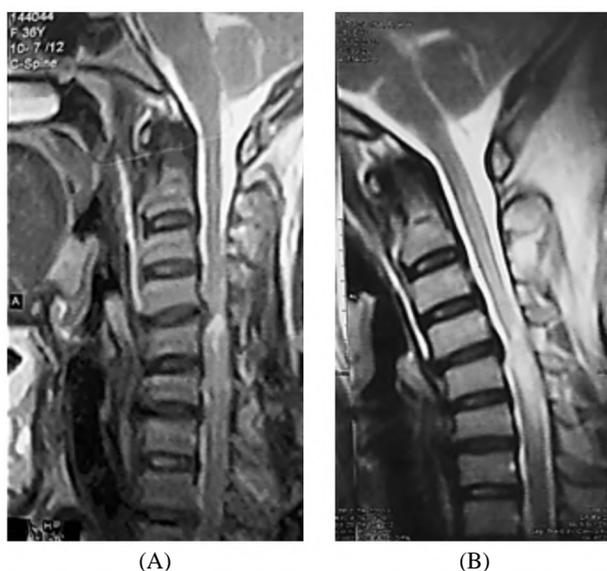
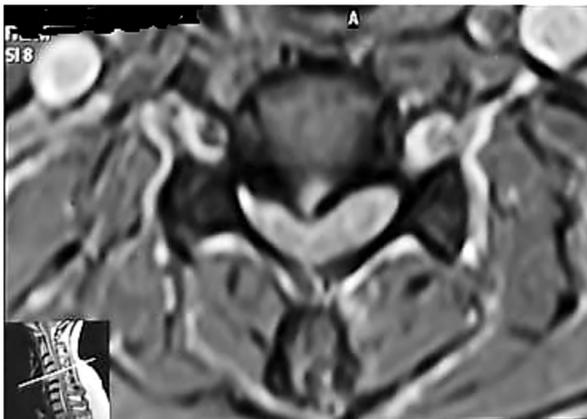


Fig. (1): (A) Sagittal T2-weighted image of MRI cervical spine showed large central herniated cervical disc C4-5 intending thecal sac and compressing cord causing cord signal opposite C4-5. (B) Sagittal T2-weighted image of MRI cervical spine (3 months later) showed regression of the large disc herniation at C4-5 level with progression of cord signal from C4 to C6.

Case (2):

A 45-year-old man presented with neck pain and radicular pain in the right upper extremity. On examination, he has no motor or sensory deficits. MRI showed a right paracentral disc herniation at the C4-C5 level compressing the corresponding nerve root (Fig. 2-A). The patient was scheduled

for an elective anterior cervical discectomy and fusion. Before the time of the planned surgery, he reported marked improvement in his complaints. So, we decided to continue conservative treatment. One year after the initial presentation, the patient is pain-free and MRI of the cervical spine showed regression in disc herniation (Fig. 2-B).



(A)



(B)

Fig. (2): (A) Axial T2-weighted image of MRI cervical spine showing large paracentral herniated cervical disc C4-5 intending thecal sac and compressing the corresponding nerve root. (B) Axial T2-weighted image of MRI cervical spine (one year later) showing regression of the disc herniation at C4-5 level.

Case (3):

A 34-year-old female patient presented with neck pain and bilateral brachialgia of C6 distribution, Rt more than Lt, and was diagnosed with C5-6 CDP (Fig. 3-A).

She documented symptomatic improvement on conservative treatment and attended the OPD regularly for follow-up. MRI of the cervical spine done 16 months after the initial presentation showed regression of disc herniation (Fig. 3-B).



(A)



(B)

Fig. (3): (A) Sagittal T2-weighted image of MRI cervical spine showing central herniated cervical disc C5-6 intending thecal sac and compressing the cord. (B) Sagittal T2-weighted image of MRI cervical spine (16 months later) showing regression of the disc herniation at C5-6 level.

Discussion

The spontaneous regression of herniated lumbar discs has been well documented since Guinto et al., reported a case in 1984 [5-8].

However, fewer cases of spontaneous regression of cervical disc herniation (CDH) have been reported [9,10,11], especially those confirmed by magnetic resonance imaging (MRI) [12,13,14].

In 1992, Krieger and Maniker published the first report on the spontaneous regression of CDH [9].

Limited data about spontaneous regression of CDH are available. Rahimizadeh et al., [15] have reported 26 cases, Gürkanlar et al., [12] 6 cases, Vinas et al., [16] 4 cases, Mochida et al., [10] 15 cases and Turk et al., [4] reported 14 cases.

The majority of patients with acute cervical radiculopathy caused by CDH do not require surgery [17], and the regression of the extruded cervical disc can be demonstrated radiologically by CT and MRI. A combination of anti-inflammatory medications (NSAIDs or short-course tapering steroids), adequate pain medication, and intermittent cervical traction (e.g., gradually increasing up to 10-15 lbs for 10-15 minutes, 2-3 times a day) may help ease the recovery process. Surgery is recommended for those who do not improve or have progressive neurological deficits while receiving non-surgical treatment [10,18].

The spontaneous regression of CDH is thought to be caused by three mechanisms. The first mechanism involves dehydration and shrinkage of the herniated nucleus pulposus [19]. For the second, there is a retraction of the protruded disc [19]. In the third, there is enzymatic degradation and phagocytosis of the extruded/sequestered disc material due to an inflammatory reaction and neovascularization [20].

According to the third hypothesis, when discs penetrate the annulus fibrosus and posterior longitudinal ligament, they are recognized as foreign bodies in the epidural space, resulting in inflammatory reaction and disc resorption (e.g., the intervertebral disc produces chemokines such as monocyte chemoattractant protein 1 (MCP-1) and interleukin 8 (IL-8) that act as chemoattractants for macrophages and capillaries) [5,20]. However, it is possible that all 3 mechanisms play a role in the regression and disappearance of the herniated disc tissue.

A herniated nucleus pulposus of the cervical disc typically presents with a symptom complex of radiculopathy, myelopathy, or both. MRI and/or myelograms are then performed to determine the presence and level of herniation [9]. Due to its high sensitivity to water content, MRI can also be used to assess the generative disc. The most common MRI techniques for examining intervertebral disc health are T2-weighted (T2-WI) and T1-weighted (T1-WI) [21].

MRI imaging is the best method for the diagnosis of spinal lesions and neural compression. It is also the preferred radiological tool for displaying the magnitude, exact location, and level of the disc. In addition, serial MRIs are preferred for documenting resorption [21].

In our study, we included six patients. Of these, 66.66% (n=4) were female and 33.33% (n=2) were male. The patients' mean age was 37.5 years (range 32-45). One patient (16.66%) presented with myelopathy and five (83.33%) presented with neck pain and radiculopathy. Discs were paracentral in 4 cases (66.66%) and central in 2 cases (33.33%); only one case with a central disc bulge also had a cord signal. The most affected cervical discs were C5-C6 (3 cases = 50%), C4-C5 (2 cases = 33.33%), and C6-C7 (1 case = 16.66%). On successive MRI scans, herniated cervical discs spontaneously regressed at an average time interval of 8.83 months after the initial presentation.

In Turk et al.'s series [4] published in 2019, including 14 patients, 10 cases were female and 4 cases were male. The patients' mean age was 40.79 years. All cases complained of radiculopathy. 11 cases had foraminal and paracentral disc bulges, and 3 cases had central and diffuse disc bulges. The most affected cervical discs were at the levels of C5-C6 (5 cases), C6-C7 (5 cases), then C4-C5 (4 cases). Patients' complaints decreased at a mean of 5.07 weeks; the mean duration between 2 MRIs was 9.71 months.

In Rahimizadeh et al.'s series [15] published in 2013, including 26 patients, 15 cases (57.7%) were male and 11 cases (42.3%) were female. The patients' mean age was 37.3 years. 100% of patients complained of radiculopathy, and all cases had foraminal discs. Most affected cervical discs were at the level of C5-C6 (16 cases) and C6-C7 (10 cases). On successive MRI scans, herniated cervical discs spontaneously regressed at an average time interval of 3-4 months after the initial presentation.

In Gurkanlar et al.'s series [12] published in 2006, including 6 patients, 4 cases were female and 2 cases were male. The patients' mean age was 38.8 years. 3 cases complained of radiculopathy, 2 cases complained of neck pain and radiculopathy, and one case complained of neck pain only. There were two foraminal disc bulges, two paracentral disc bulges, one foraminal and paracentral disc bulge, and one central disc bulge. The most affected cervical disc was at the level of C6-C7 (3 cases), C5-C6 (2 cases), and C4-C5 (one case). The time interval between initial presentation (1st MRI) and spontaneous regression of herniated cervical disc (2nd MRI follow-up) ranged from 6 months to 5 years.

In Mochida et al.'s series [10] published in 1998, the study included 38 patients with CDH who had repeated MRI scans. In 15 patients (40%) (All with partial regression), the herniated volume decreased, but in the remaining 23 cases (60%) there was no change. There were no differences found between the two groups in terms of age, gender, affected level, or time between scans. The mean age of the patients was 50.3 years. 6 of 21 patients with radicular pain and/or paresthesia had some symptomatic relief (regardless presence or absence of herniated disc regression); UL amyotrophy in 5 of 9 patients (treated conservatively) showed regression in the herniated cervical disc and sufficient recovery in affected motor power. In myelopathic patients, 4 of 8 herniations decreased in size, and 5 of 8 patients with myelopathy required surgery. 9 cases had lateral disc bulges and 6 cases had central disc bulges. The most affected cervical disc level was C5-C6. The interval from the onset of symptoms to the initial MRI examination was shorter in the regression group than in the no change group.

Conclusion:

Conservative treatment of herniated cervical discs is a good option in patients with bearable pain and without neurological deficits. Satisfactory clinical improvement can be achieved conservatively in a significant percentage of patients.

Moreover, the decrease in size of the herniated cervical disc that causes relief of neural compression can be demonstrated by images in some cases. Although a limited number of case reports are available in the literature, we believe that these findings support the role of conservative treatment in patients with CDH, who do not have a neurologic deficit.

Declaration of patient consent:

Patient's consent is not required as patients' identity is not disclosed or compromised.

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Conflicts of interest: There are no conflicts of interest.

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التراجع التلقائي لإنزلاق الغضاريف العنقية

تراجع الانزلاق الغضروفي العنقي لم يتم بحثه بشكل شائع مثل تراجع الأنزلاق الغضروفي القطني خاصة في الدراسات التي تم تأكيدها بواسطة التصوير بالرنين المغناطيسي. ويمكن علاج الغضروفي العنقي إما بطريقة تحفظية أو جراحياً.

الغرض من الدراسة: محاولة إظهار تأثير العلاج التحفظي على تراجع الإنزلاق الغضروفي العنقي المثبت بواسطة التصوير بالرنين المغناطيسي.

المرضى وطرق البحث: تم تسجيل ٦ مرضى للدراسة بواسطة العلاج التحفظي يعانون من آلام بالرقبة والتهاب أعصاب الأطراف العلوية وتم تشخيصهم على أنهم يعانون من إنزلاق غضروف الرقبة بواسطة التصوير بالرنين المغناطيسي. تم تسجيل مريض واحد فقط كان مصاباً باعتلال النخاع ولكن رفض العلاج الجراحي في دراستنا.

النتائج: تضمنت الدراسة ستة مرضى، ٤ حالات للإناث وحالتين من الذكور. تتراوح أعمارهم من سن ٣٢ إلى ٤٥ سنة بمتوسط عمر ٣٧.٥ سنة. خمسة مرضى يعانون من آلام الرقبة والتهاب أعصاب الأطراف العلوية ومريض واحد يعاني من الاعتلال النخاعي للحبل الشوكي. تبين وجود الغضروف في المنتصف في حالتين و٤ حالات كان بجانب المنتصف وحالة واحدة أظهرت تأثر الحبل الشوكي. وكان الغضروف العنقي بين الفقرتين الخامسة والسادسة هو أكثر الحالات تأثراً بثلاثة حالات.

الخلاصة: بعد العلاج التحفظي لإنزلاق الغضاريف العنقية خياراً جيداً للمرضى الذين لا يعانون من عجز عصبي حيث يمكن تحقيق تحسن إكلينيكي مرض بنسبة كبيرة في المرضى. كما أنه يمكن إثبات تراجع حجم الانزلاق الغضروفي العنقي الذي يسبب الضغط على الأعصاب بواسطة الإشاعات في بعض الحالات.